Hawkeye 3-exposure HDR

Note: The previous version of the document described the two exposure procedure. It is recommended not to use the two exposures but use three instead. It is slower but gives better results. The MSP firmware is still available for two exposures. Please contact sjelavic123@gmail.com for additional information.

Required Support Software

Download:

https://www.theimagingsource.com/support/downloads-for-windows/software-development-kits-sdks/icimagingcontrolcsharp/

Once downloaded, run the .exe file for install the TIS components.

Download Hawkeye HDR app:

https://github.com/vintagefilmography/hdr

HDR Windows software for Hawkeye

Note: Hawkeye board V12 or higher and MSP FW mod are required for proper HDR operation to provide three camera triggers for a single external trigger.

The capture app is the windows software that runs HDR on the Wolverine scanner that has the Hawkeye mod. The software is written in Visual Basic and it connects to the camera and waits for the image ready event. After the event is received the sw stores the first image and lowers the camera exposure for the second image. When the second event is received it stores the second image. The process then repeats. The hawkeye MSP430 firmware has a mod to trigger the camera three times for each external trigger.

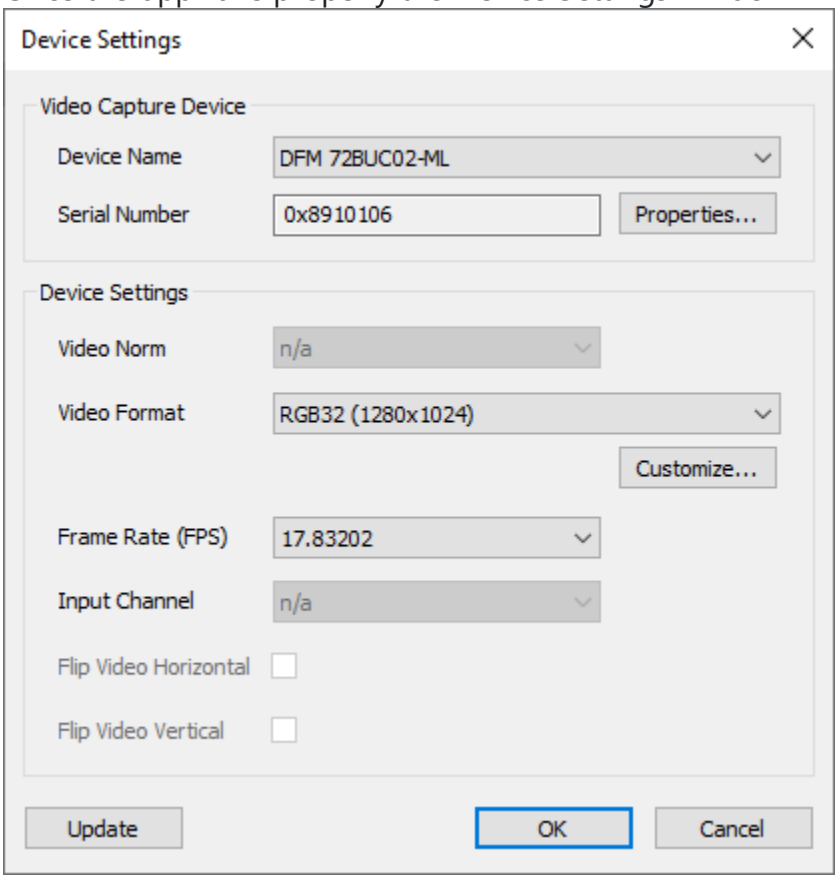
To run the sw go to the .../bin/Release dir and run the hdr1.exe file.

If you run into DLL issues, make sure that the TIS setup has been run as instructed above.

Also try installing Microsoft redistributable package.
https://learn.microsoft.com/en-us/cpp/windows/latest-supported-vc-redist?view=msvc-170

Install the 2015-2022 version and see if this fixes your issue.

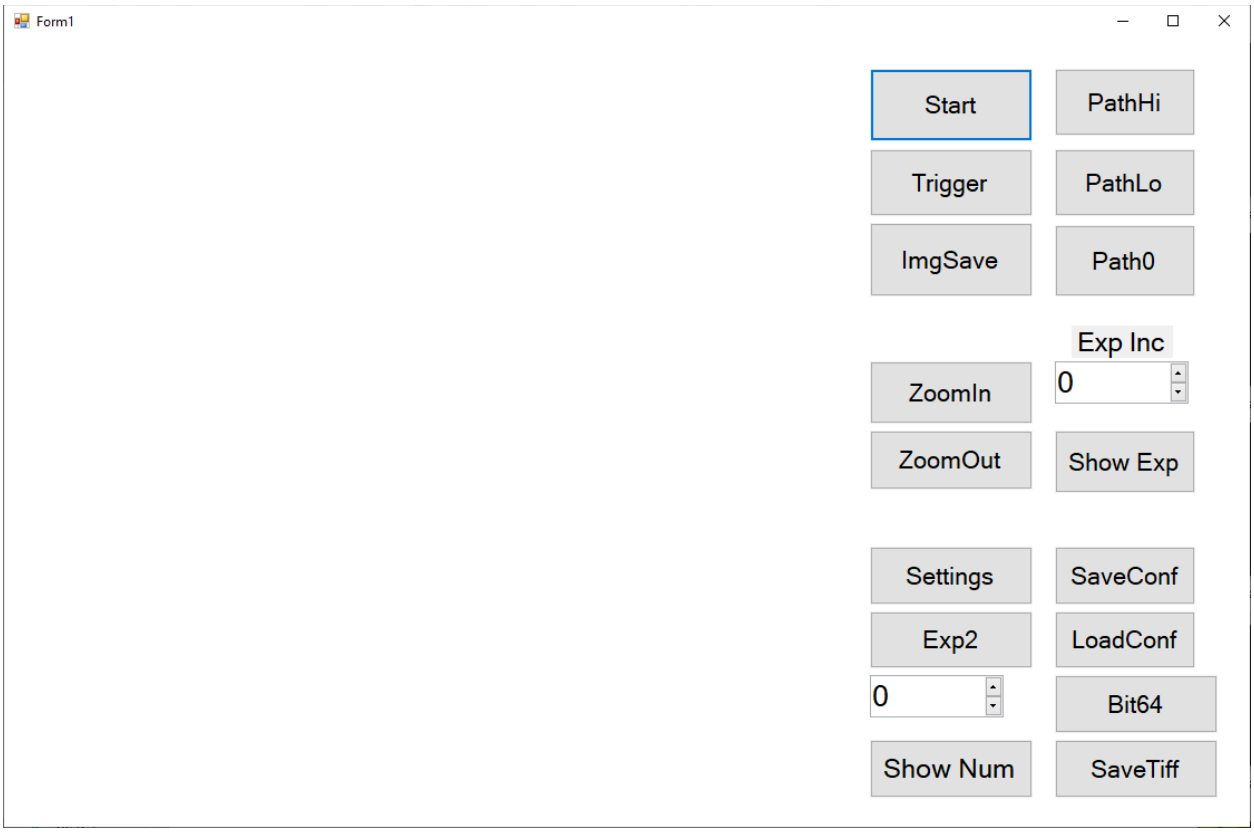
Once the app runs properly the Device Settings window will pop up.



Select the video format. For BUC02 it is recommended to go with 1280x1024.

Make sure to set the highest FPS possible.

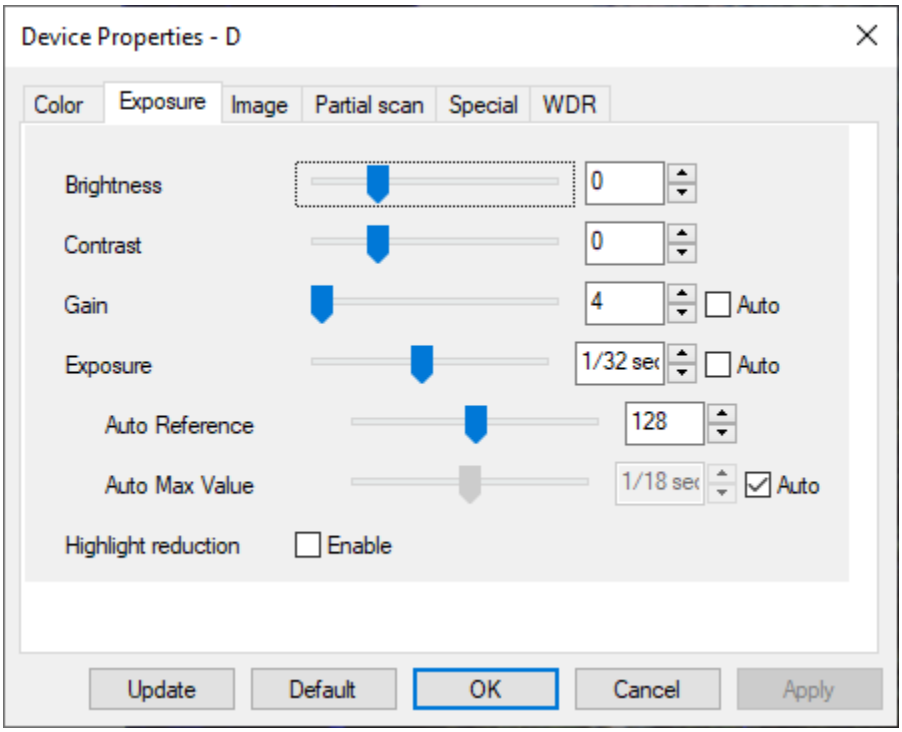
Click OK. A new window will open.



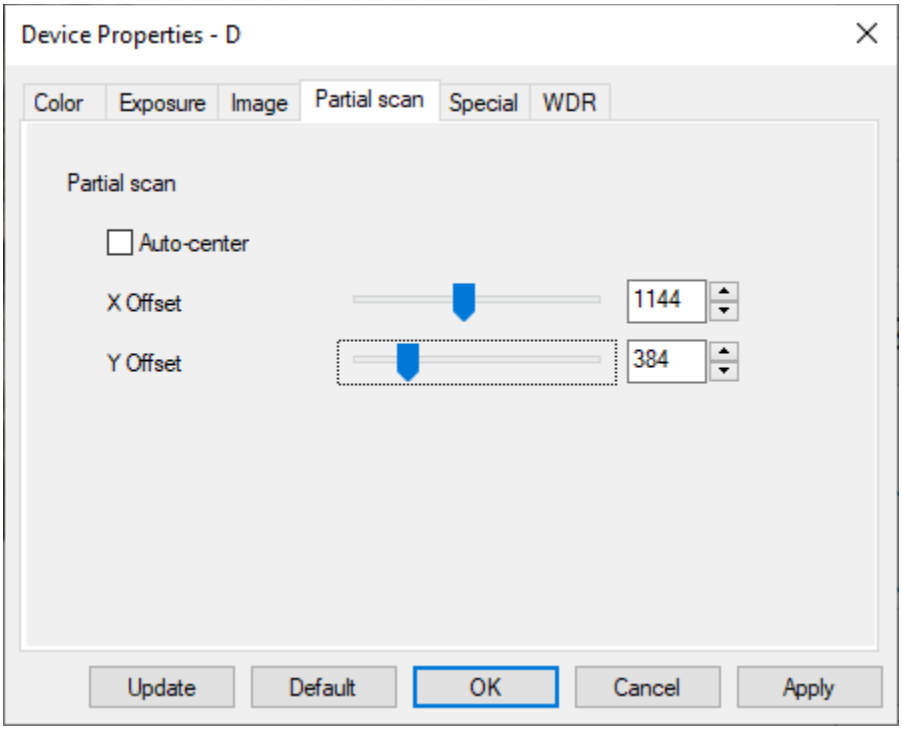
Toggle the Trigger button to make sure the trigger is not on and then click the Start button. The camera preview should get displayed. Click on ZoomOut to be able to see the whole frame.


Form1
Start
PathHi
Trigger
PathLo
ImgSave
Path0
Exp Inc
ZoomIn
0
ZoomOut
Show Exp
Settings
SaveConf
Exp2
LoadConf
0
Bit64
Show Num
SaveTiff

Click on the settings button.

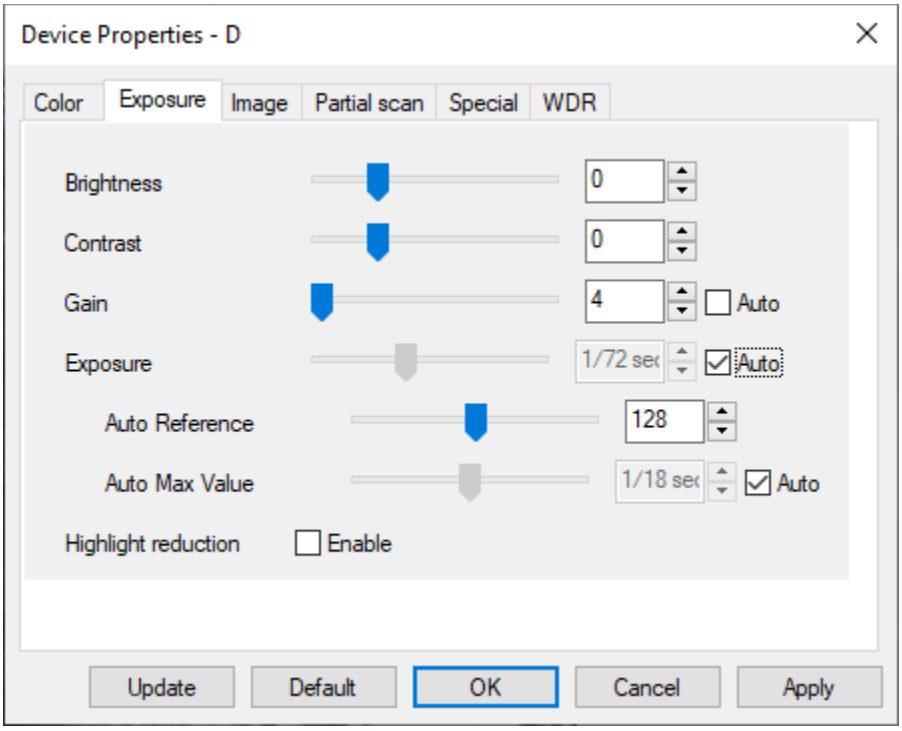


Open up partial scan.



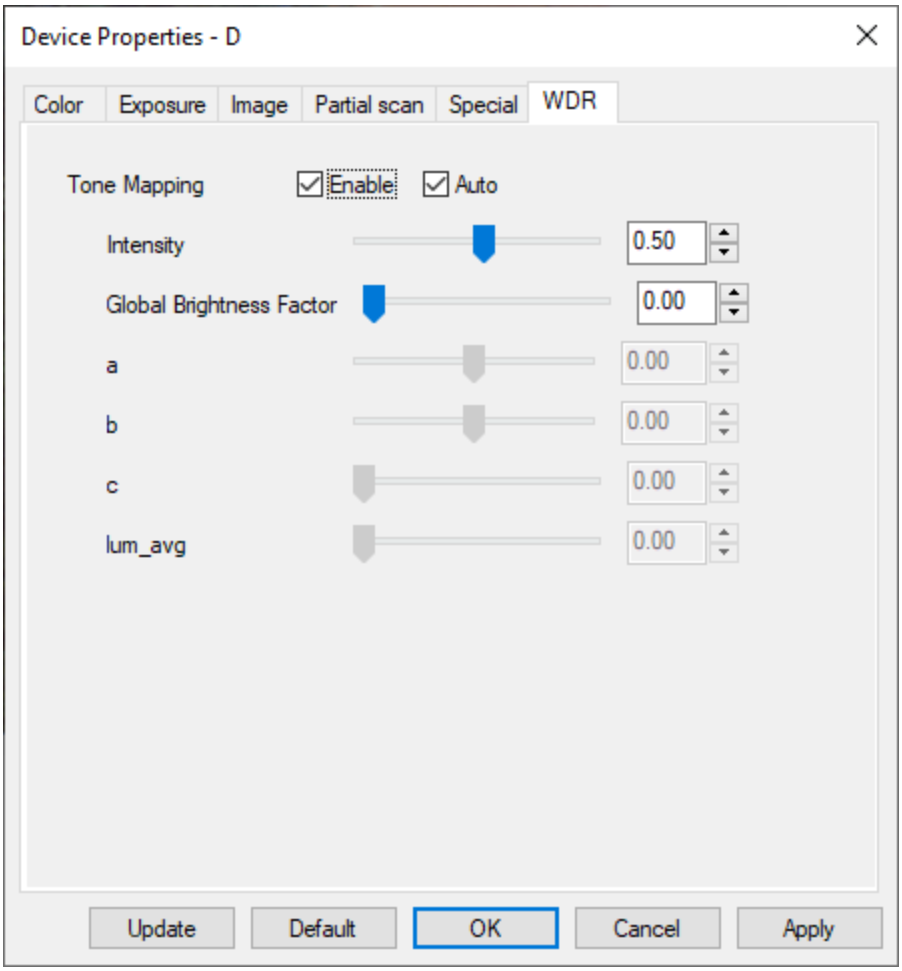
Turn auto center off and adjust x and y so that the frame is centered. Run the machine for a few frames just to make sure that the claw is not engaged (frame stationary).

Open up exposure tab and turn auto exposure on. This will set proper exposure.



After that, turn auto exposure off.

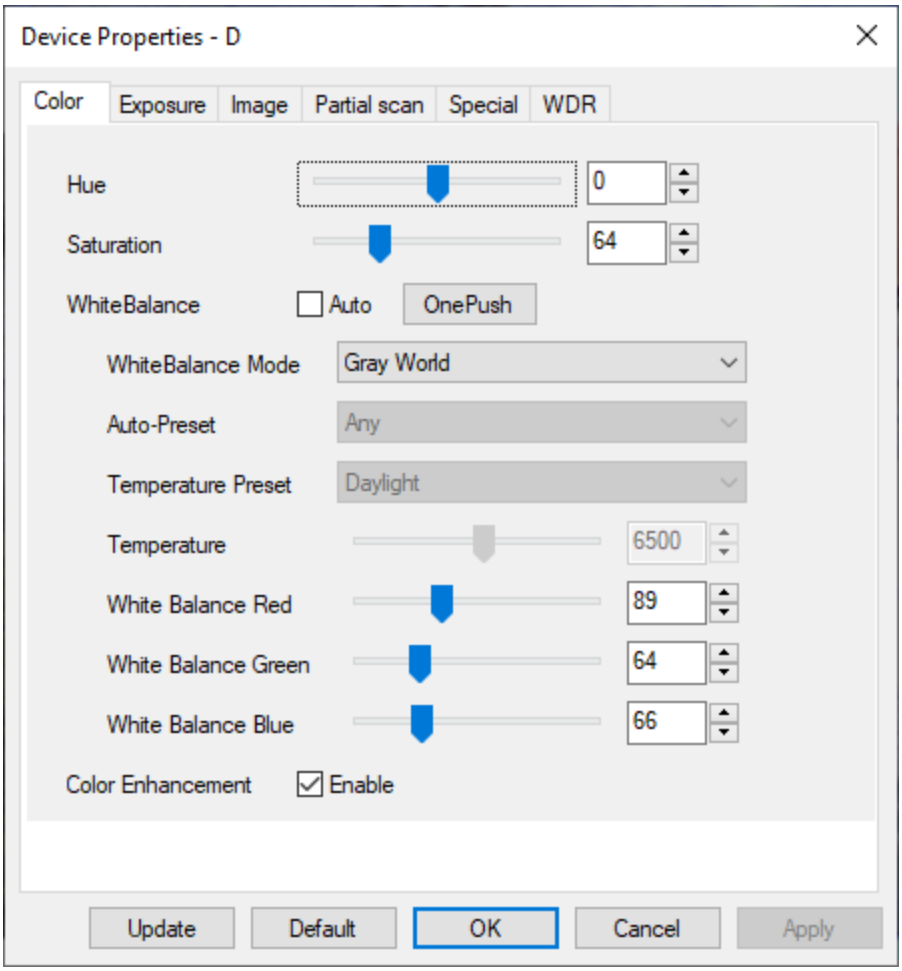
Make sure WDR is on:



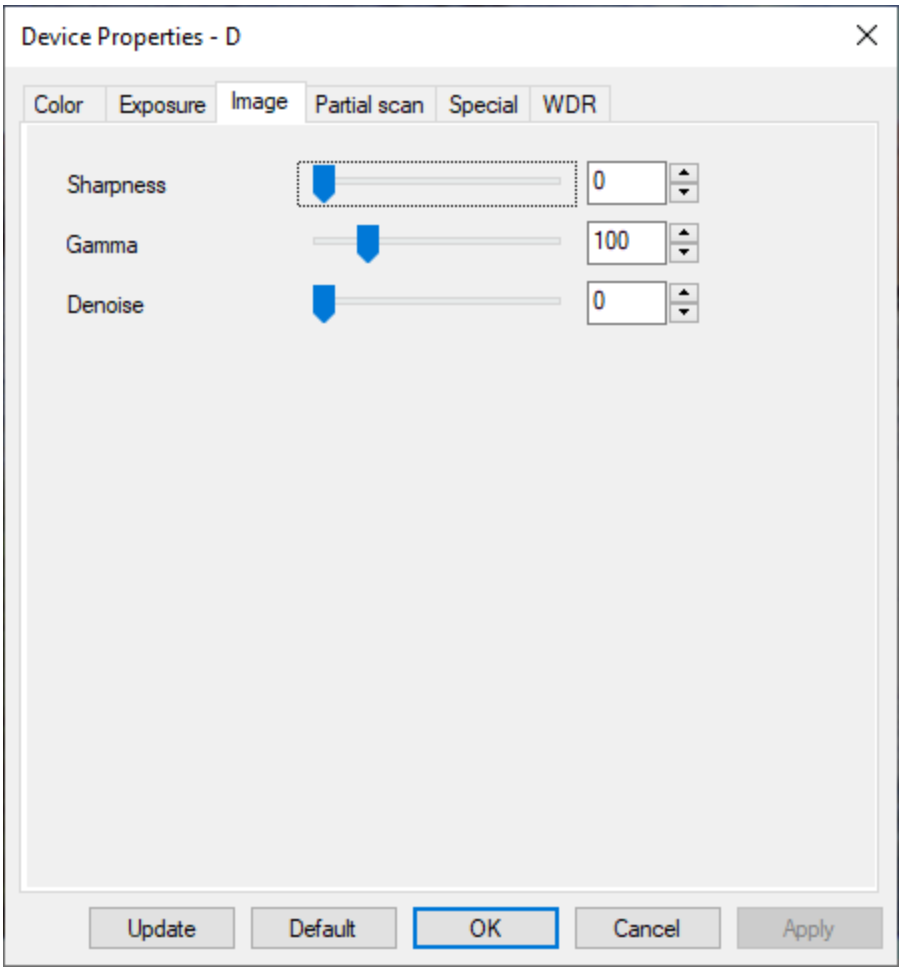
Then turn auto mode to off. Use auto mode to properly set the WDR. Pick a scene with lots of bright and dark areas and then turn the auto mode to on. This will set the DR. Then turn auto mode to off. If you leave it then it will continuously adjust which could cause flicker.

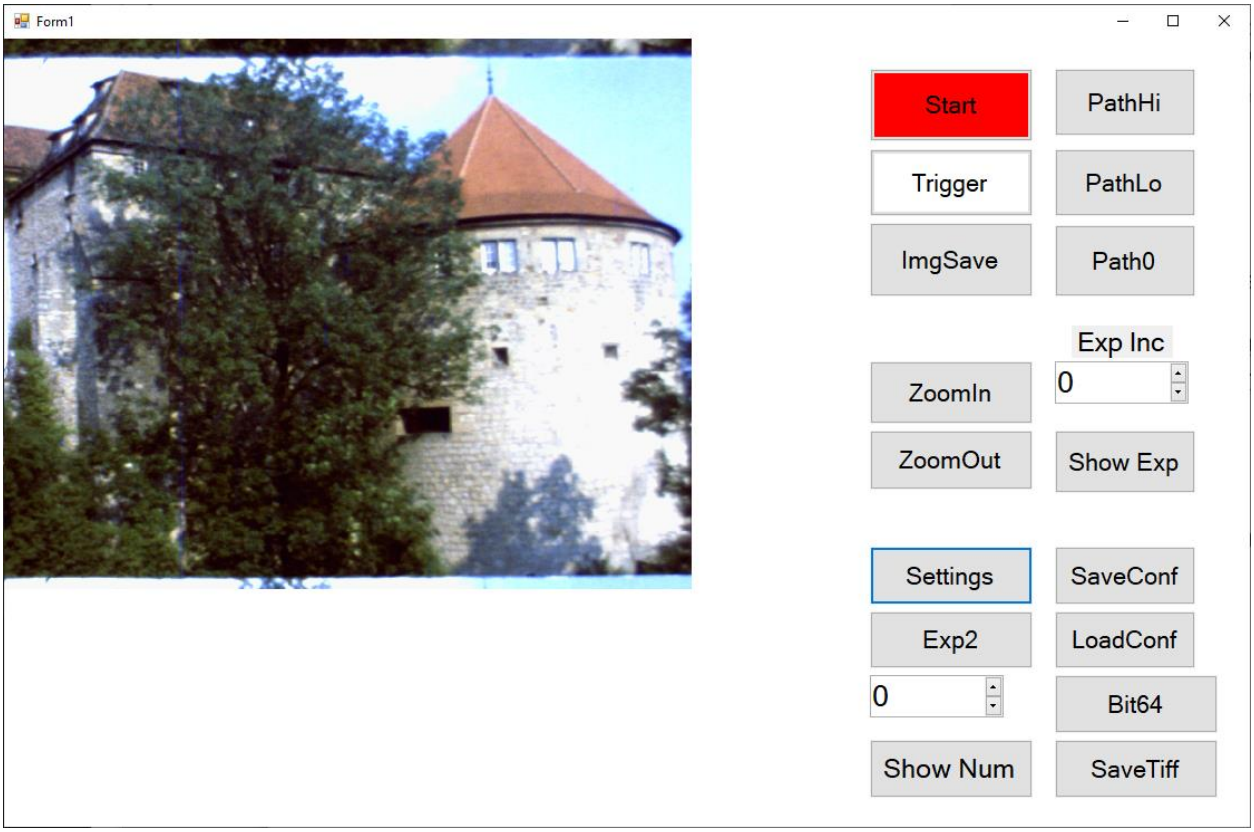
Go to the Color tab and turn the white balance on for a few seconds. Check the colors. If they are not the best try another scene and turn the white balance auto on there and check the colors. If ok then turn the auto mode to off. Do not leave it on because it will be changing the colors continuously.

If still not happy with the white balance then adjust it manually using the red, green, and blue sliders.


Device Properties - D
Color
Exposure
Image
Partial scan
Special
WDR
Hue
0
Saturation
64
WhiteBalance
Auto
OnePush
WhiteBalance Mode
Gray World
Auto-Preset
Any
Temperature Preset
Daylight
Temperature
6500
White Balance Red
89
White Balance Green
64
White Balance Blue
66
Color Enhancement
Enable
Update
Default
OK
Cancel
Apply

No gamma:


Device Properties - D
Color
Exposure
Image
Partial scan
Special
WDR
Sharpness
0
Gamma
100
Denoise
0
Update
Default
OK
Cancel
Apply



Now, click on Path0, PathHi, and PathLo to set the paths for your normal, hi and low exposure images.

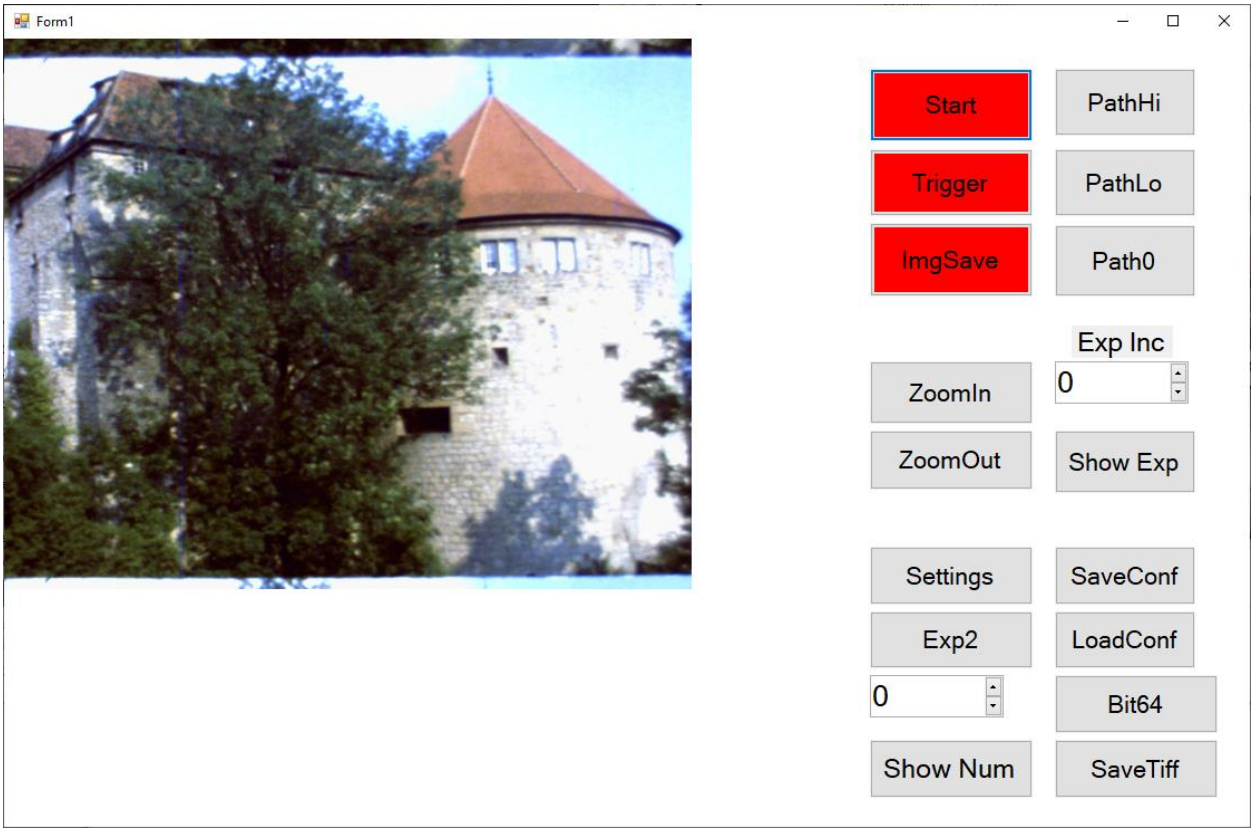
Set Exp Inc (bracketed exposure).

For example if you want the exposure to go 1 stop up and down, set the Exp Inc to 10. So it is 10 increments per stop.

Turn the Save Tiff on since jpeg is not as good for HDR.

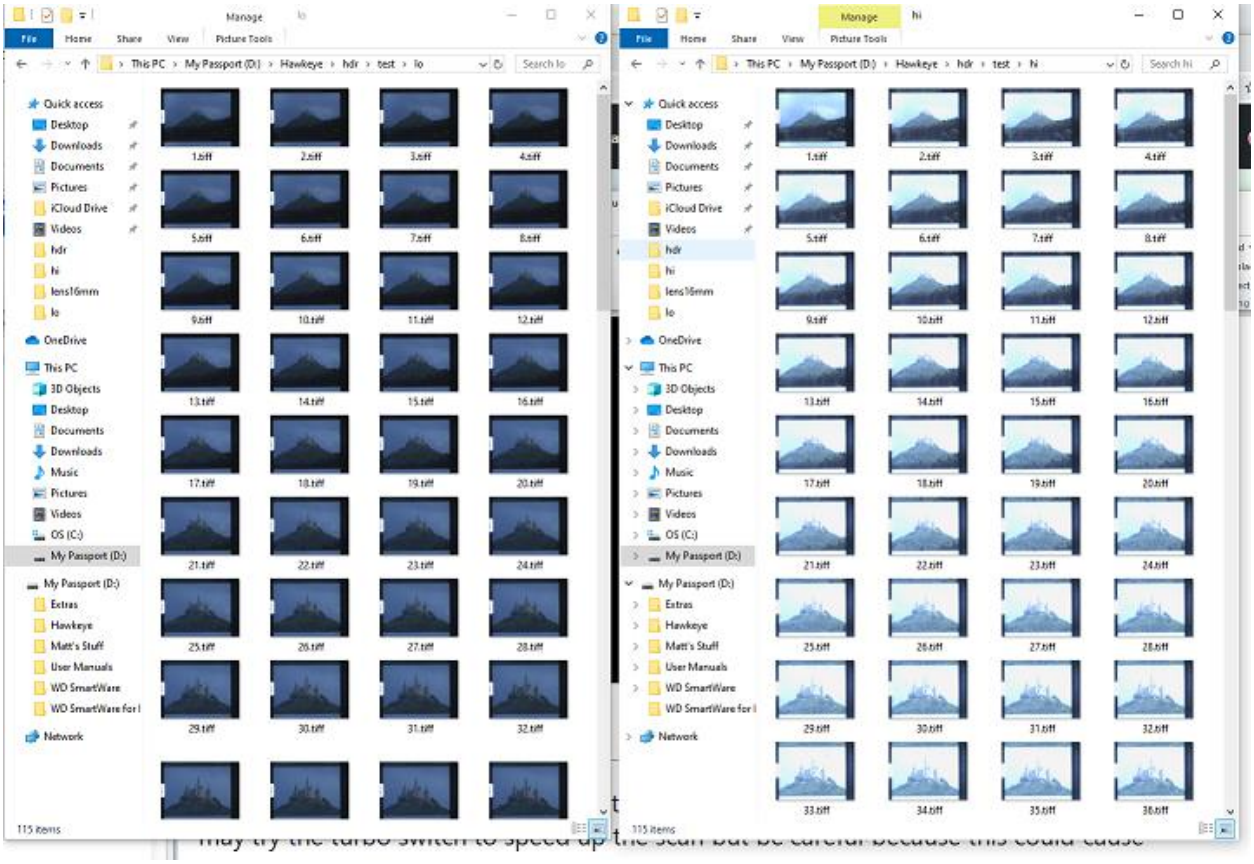
Turn the Start button off.

Turn on the Trigger button, Save button and Start button in that order.



Now you are ready to do the scan. Set the Hawkeye to slow speed and turn the Rewind switch on, on the scanner. You may try the turbo switch to speed up the scan but be careful because this could cause missed frames and the HDR exposures to go out of sequence.

Once done, you should have three directories with a bunch of images



Download enblend/enfuse from:

http://enblend.sourceforge.net/enfuse.doc/enfuse_4.2.xhtml/enfuse.html

Copy it from your download dir to your hdr work dir.

Create the following dos script and name it hdr.bat or enfuse.bat or something similar.

```
SET Input_PATCH1=c:\capture\hi
SET Input_PATCH2=c:\capture\lo
SET Input_PATCH3=c:\capture\zero
SET OUTPUT_PATCH=c:\capture\out
SET start=2
SET end=500
FOR /L %%i IN (%start%,1,%end%) DO (CALL :loopbody %%i)
GOTO :eof
:loopbody

enfuse.exe --soft-mask --exposure-weight=1.0 --saturation-weight=0.2 --contrast-weight=0.0 --entropy-weight=0.0 --exposure-optimum=0.4 --exposure-width=0.2 -v -o "%OUTPUT_PATCH%\%1.tiff" "%Input_PATCH1%\%1.tiff" "%Input_PATCH2%\%1.tiff" "%Input_PATCH3%\%1.tiff"
GOTO :eof
```

The script is also available in github.
Edit the script path names as required. The combined files will be in the out dir.

Before you run the bat file make sure that enfuse.exe and vcomp140.dll are copied over from the enfuse bin directory to the directory where the batch file is located.
And that should be it. Run the bat file.

The images on the out dir will be an HDR blend of high and low exposure providing details for the bright and dark areas.